

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**





## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>A61G 5/04</b>	<b>A1</b>	(11) International Publication Number: <b>WO 99/17701</b> (43) International Publication Date: 15 April 1999 (15.04.99)
---	-----------	--

(21) International Application Number: PCT/US98/20903

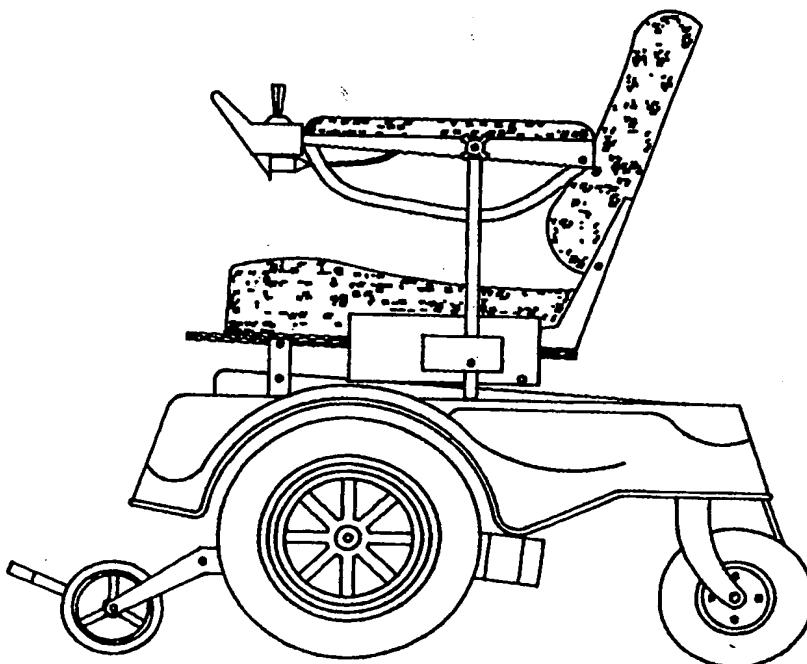
(22) International Filing Date: 5 October 1998 (05.10.98)

(30) Priority Data:  
60/061,120 6 October 1997 (06.10.97) US(71) Applicant: PRIDE HEALTH CARE, INC. [US/US]; 182  
Susquehanna Avenue, Exeter, PA 18643 (US).(72) Inventors: SCHAFFNER, Walter, E.; 950 Huntsville Road,  
Shavertown, PA 18708 (US). MULHERN, James, P.; R.R.  
2, Box 326, Hunlock Creek, PA 18621 (US). WHITE,  
Gerald, J.; R.R. 2, Box 59A, Hunlock Creek, PA 18621  
(US). ANTONISHAK, Stephen, J.; 41 East Kirmar Avenue,  
Alden, PA 18634 (US).(74) Agent: QUINN, Charles, N.; Dann, Dorfman, Herrell &  
Skillman, Suite 720, 1601 Market Street, Philadelphia, PA  
19103-2307 (US).(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR,  
BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE,  
GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ,  
LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW,  
MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ,  
TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent  
(GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent  
(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent  
(AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT,  
LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI,  
CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).**Published***With international search report.**Before the expiration of the time limit for amending the  
claims and to be republished in the event of the receipt of  
amendments.*

(54) Title: FOLDABLE POWER WHEELCHAIR

## (57) Abstract

A power chair comprising: a frame transversely foldable between operating and transport positions, a seat connected to said frame, a pair of drive wheels connected to said frame and rotatable about transverse axes below a portion of said seat supporting an occupant's thighs, motors for driving respective drive wheels, respective motor/drive wheel combinations being pivotally connected to said frame, one ground-engaging idler wheel connected to said frame and located rearward of said drive wheels and one anti-tip wheel forward of said drive wheels and positioned above ground, connected to said frame for movement relative to said frame upon encountering an obstacle.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/NO 01/00217

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	4210859	A	01/07/80	NONE	
US	4393157	A	12/07/83	BR 7906797 A	17/06/80
				CA 1118509 A	16/02/82
				DE 2967481 D	00/00/00
				DE 2967589 D	00/00/00
				DE 2967595 D	00/00/00
				EP 0010502 A,B	30/04/80
				SE 0010502 T3	
				EP 0106371 A,B	25/04/84
				SE 0106371 T3	
				EP 0109096 A,B	23/05/84
				SE 0109096 T3	
				JP 1315732 C	15/05/86
				JP 55056608 A	25/04/80
				JP 60040171 B	10/09/85

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 01/00217

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G05F 1/32, H01F 29/14

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G05F, H01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4210859 A (PAUL L. MERETSKY ET AL), 1 July 1980 (01.07.80), column 3, line 51 - column 5, line 27; column 13, line 7 - line 17, abstract	1-40
A	SU 441601 A (KRZHIZHANOVSKII POW) 1975-06-05 (abstract) World Patents Index (online). London, U.K.: Derwent Publications, Ltd. (retrieved on 2001-08-27). Retrieved from EPO WPI database. DW 197547, Accession No. 1975-M5963W see abstract and figure	1-40

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

- \* Special categories of cited documents
- \* "A" document defining the general state of the art which is not considered to be of particular relevance
- \* "E" earlier application or patent but published on or after the international filing date
- \* "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \* "O" document referring to an oral disclosure, use, exhibition or other means
- \* "P" document published prior to the international filing date but later than the priority date claimed

- \* "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \* "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \* "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- \* "&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

29 August 2001

31 -08- 2001

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Irma Bornhede/MN  
Telephone No. +46 8 782 25 00

54/54

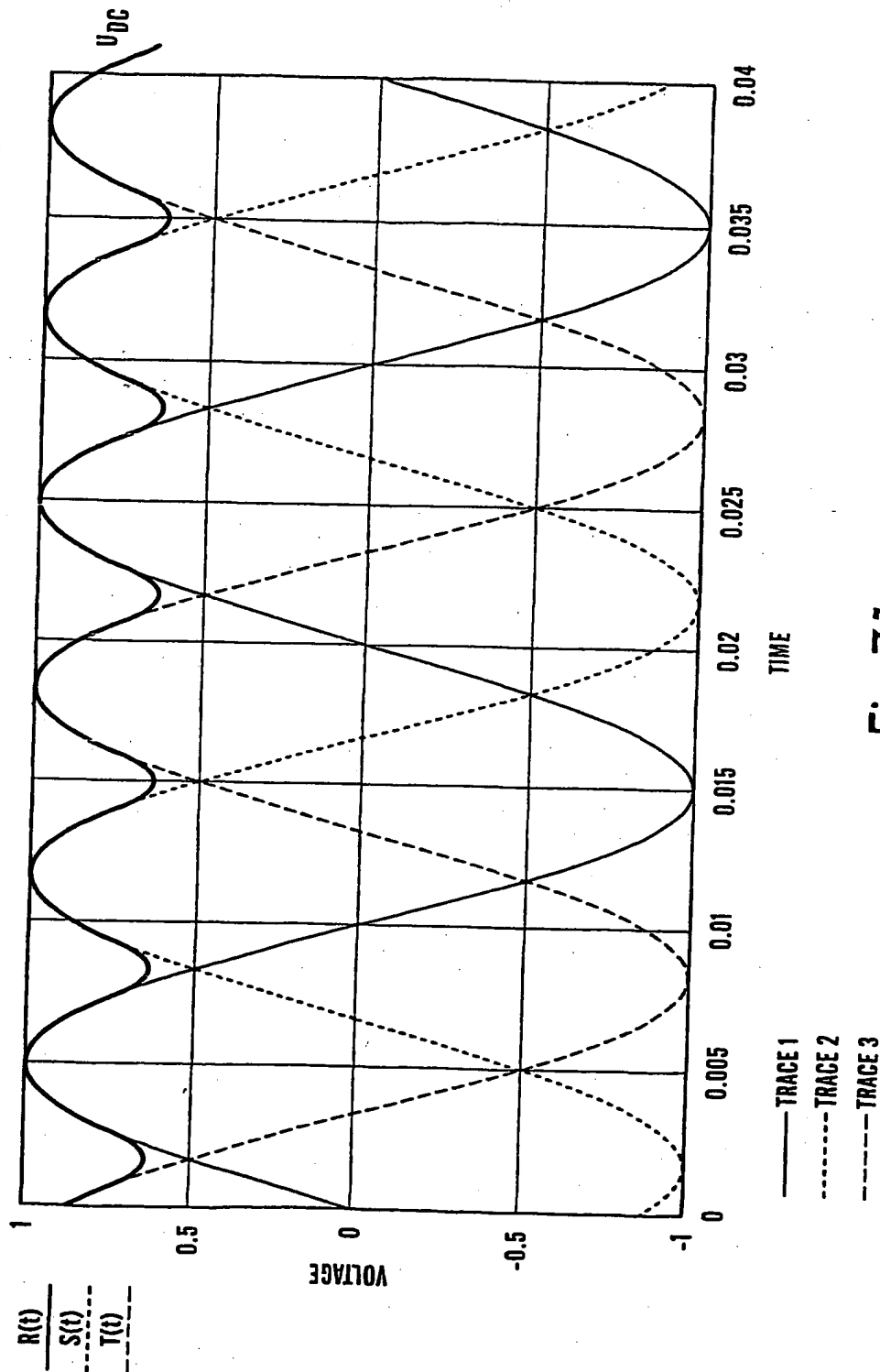


Fig. 71a

53/54

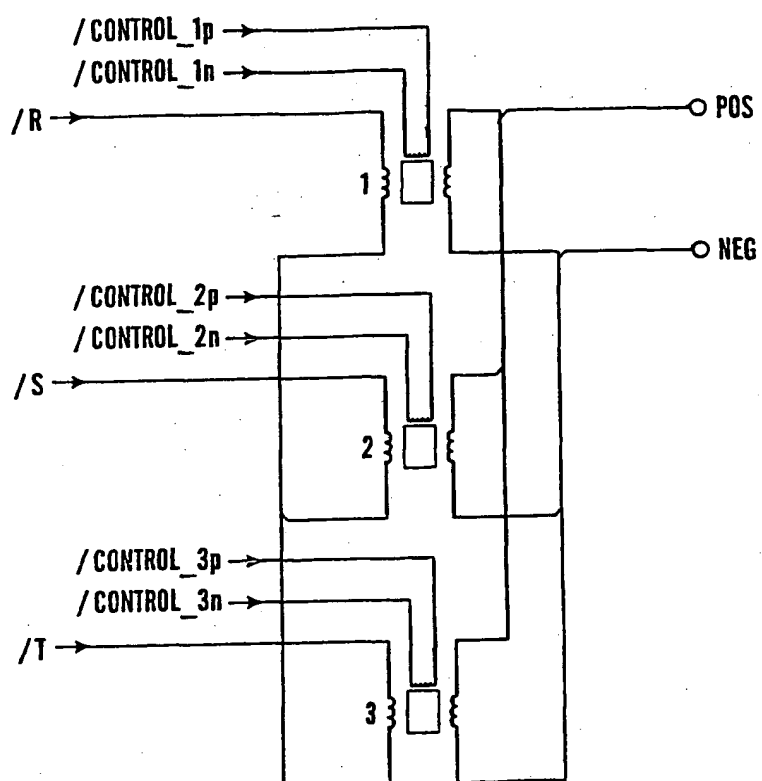


Fig.71



52/54

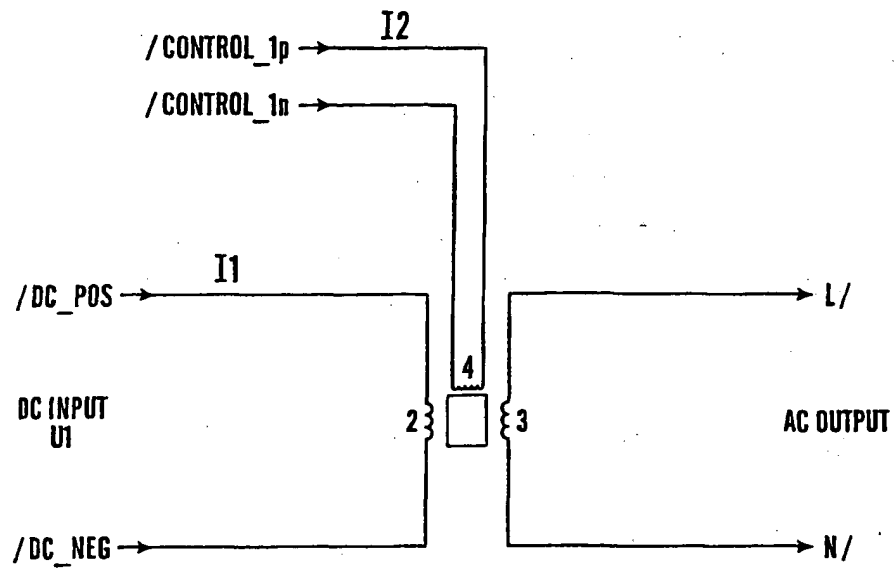


Fig.70

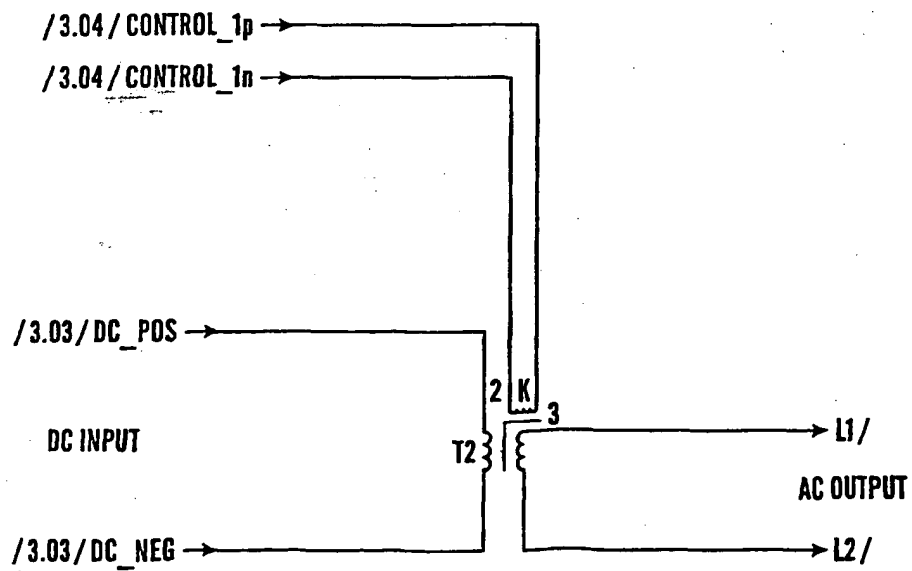


Fig.70a

51/54

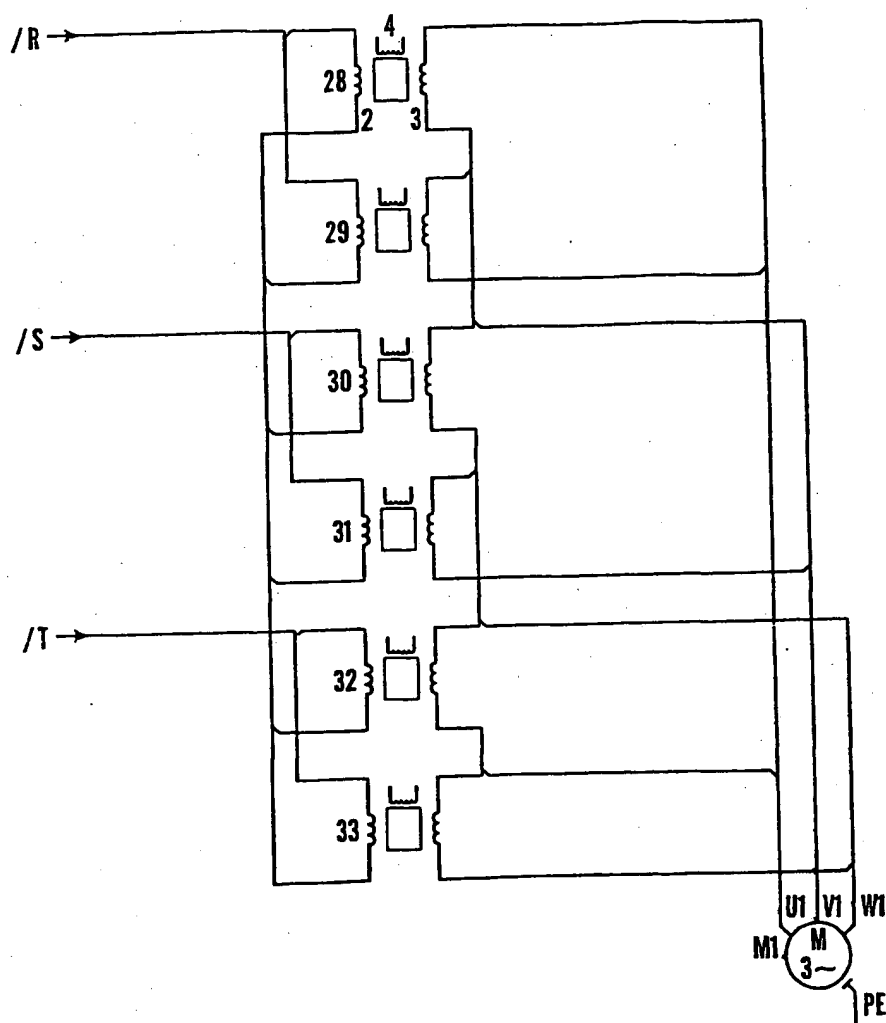
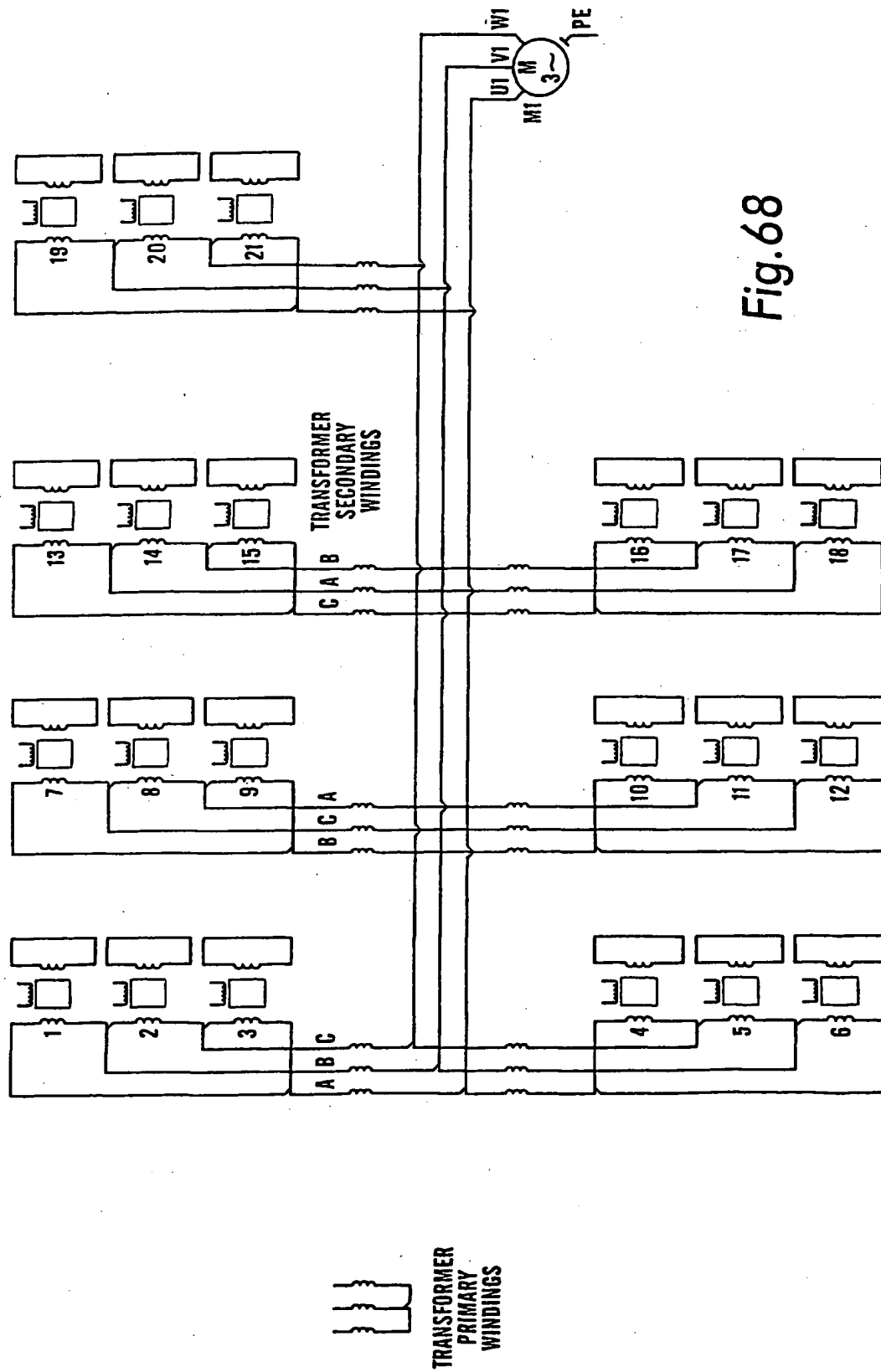


Fig.69

50/54



49/54

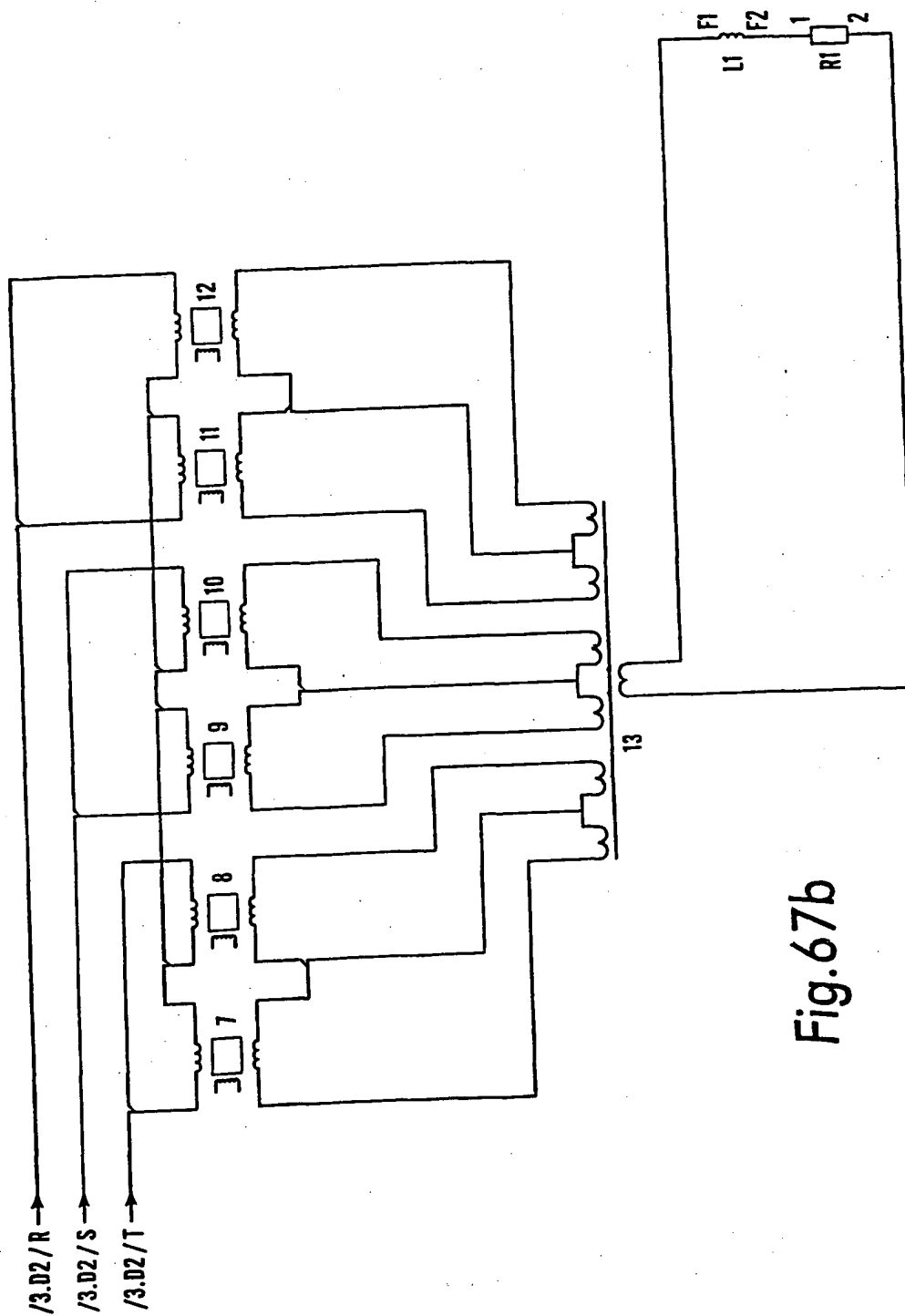


Fig.67b

48/54

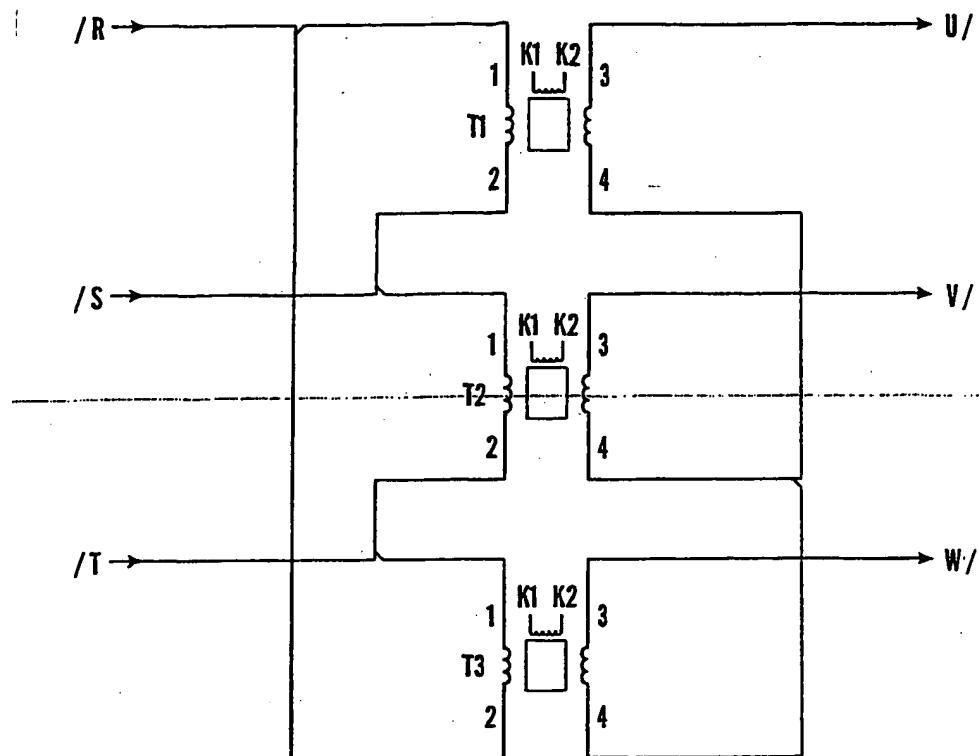


Fig.67

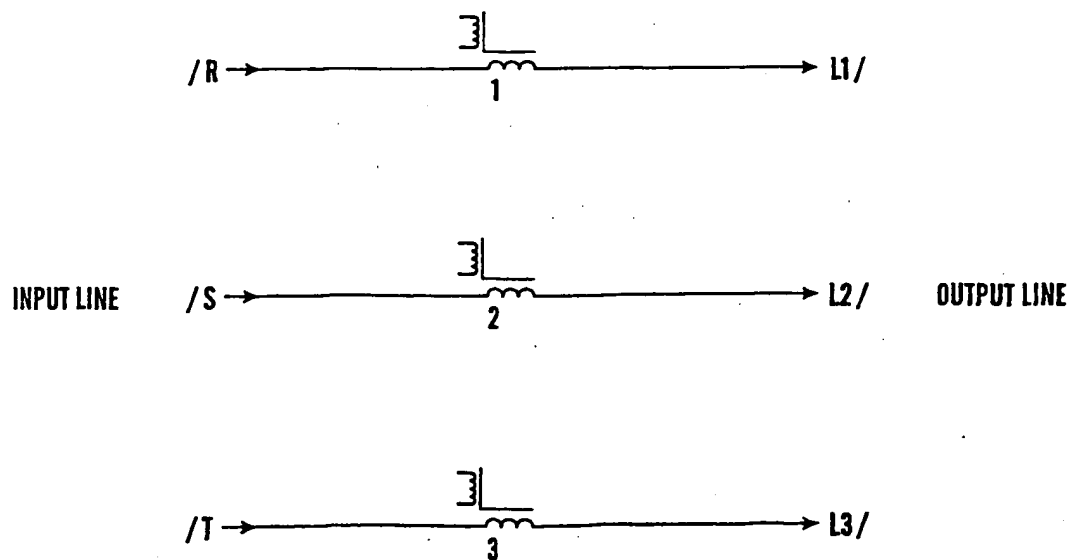


Fig.67a

47/54

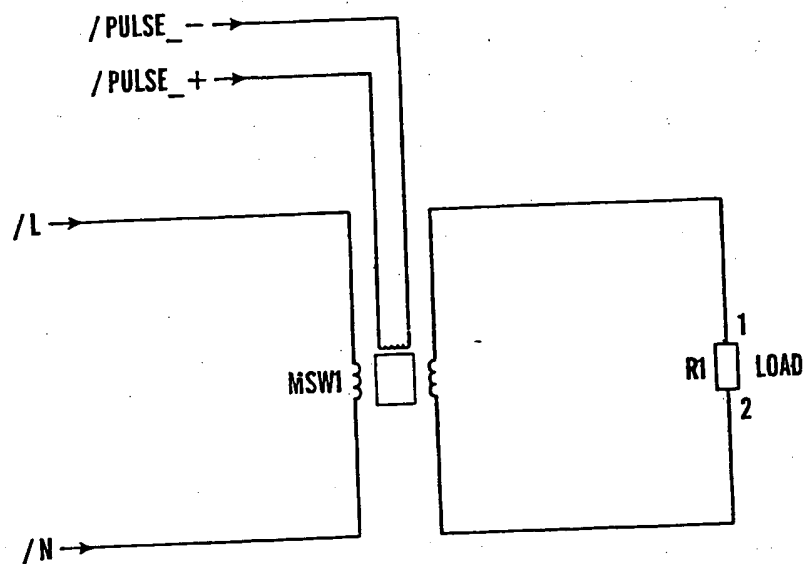


Fig.66

46/54

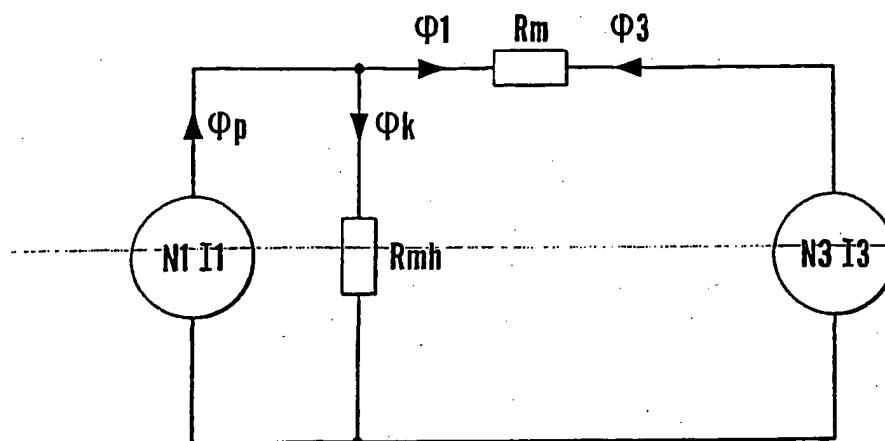


Fig.65a

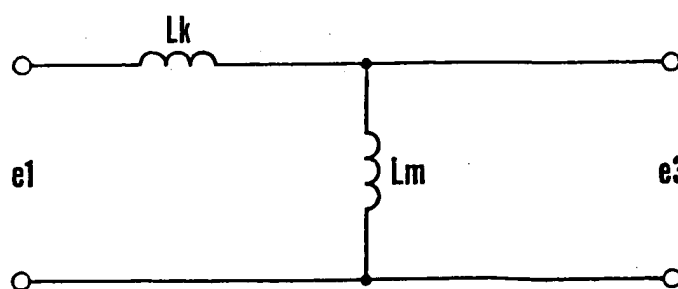


Fig.65b

45/54

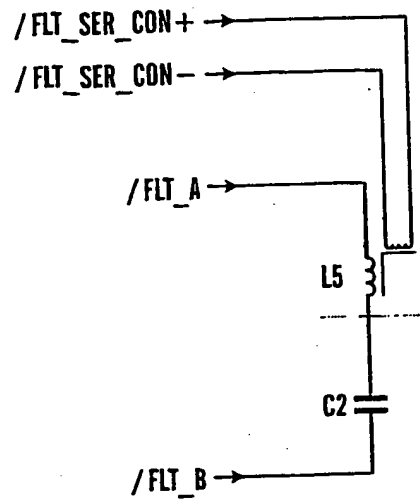


Fig.64a

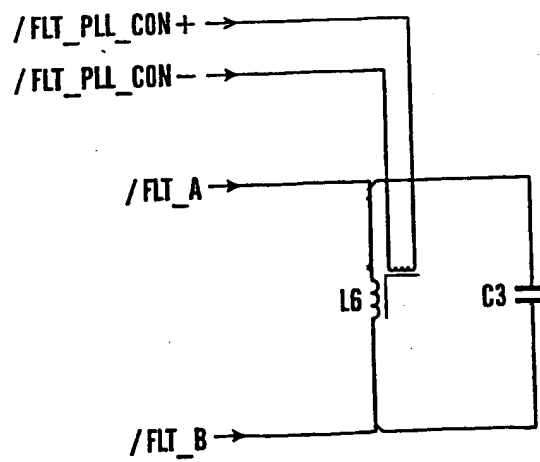


Fig.64b



44/54

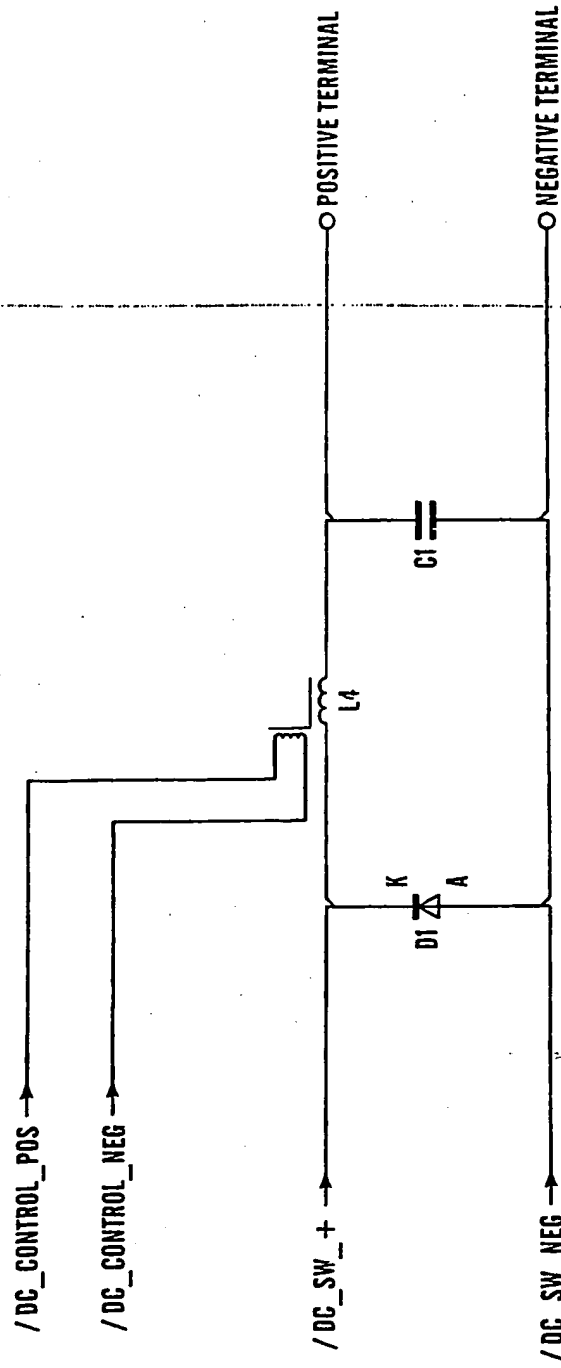


Fig.63

43/54

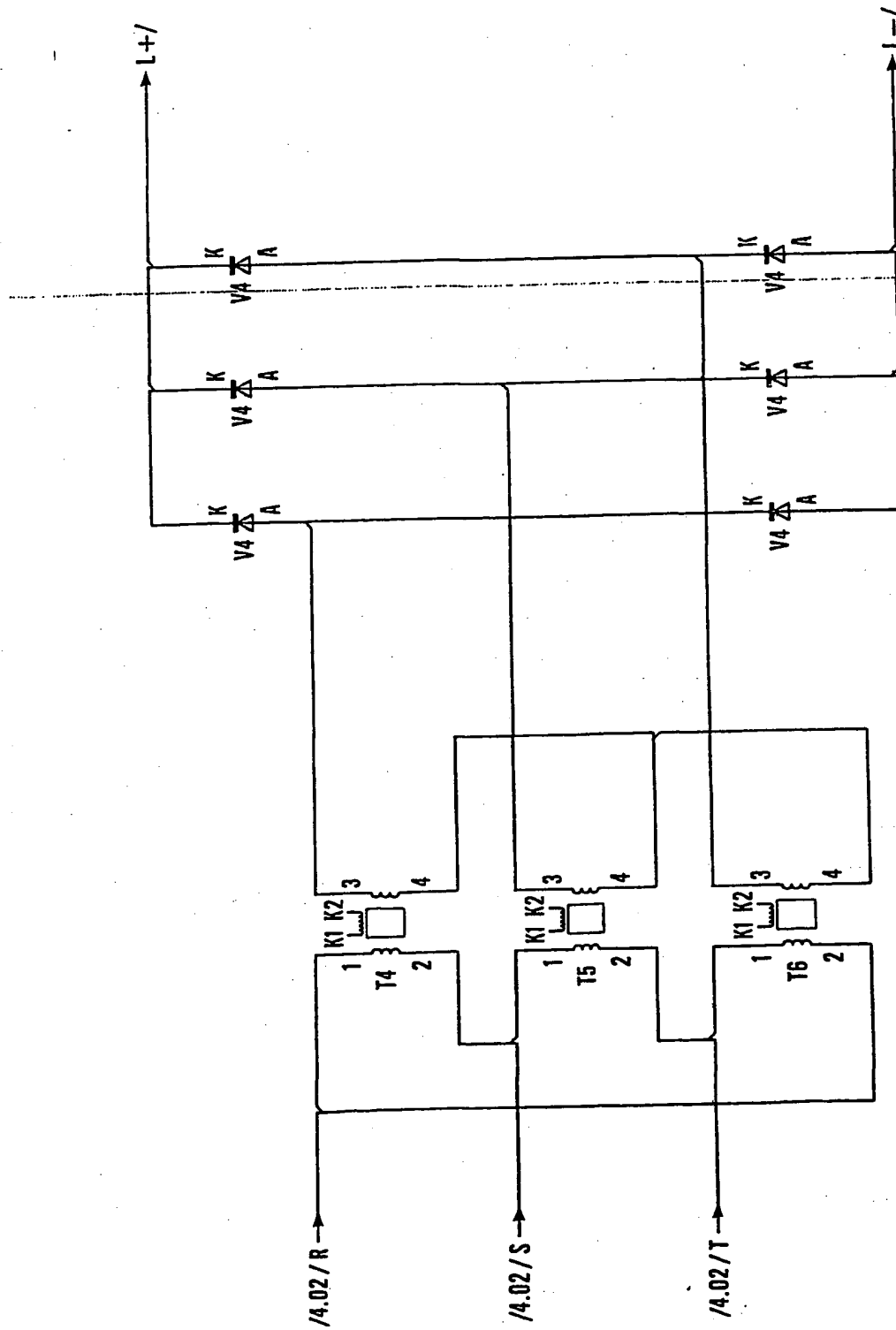


Fig. 62a

42/54

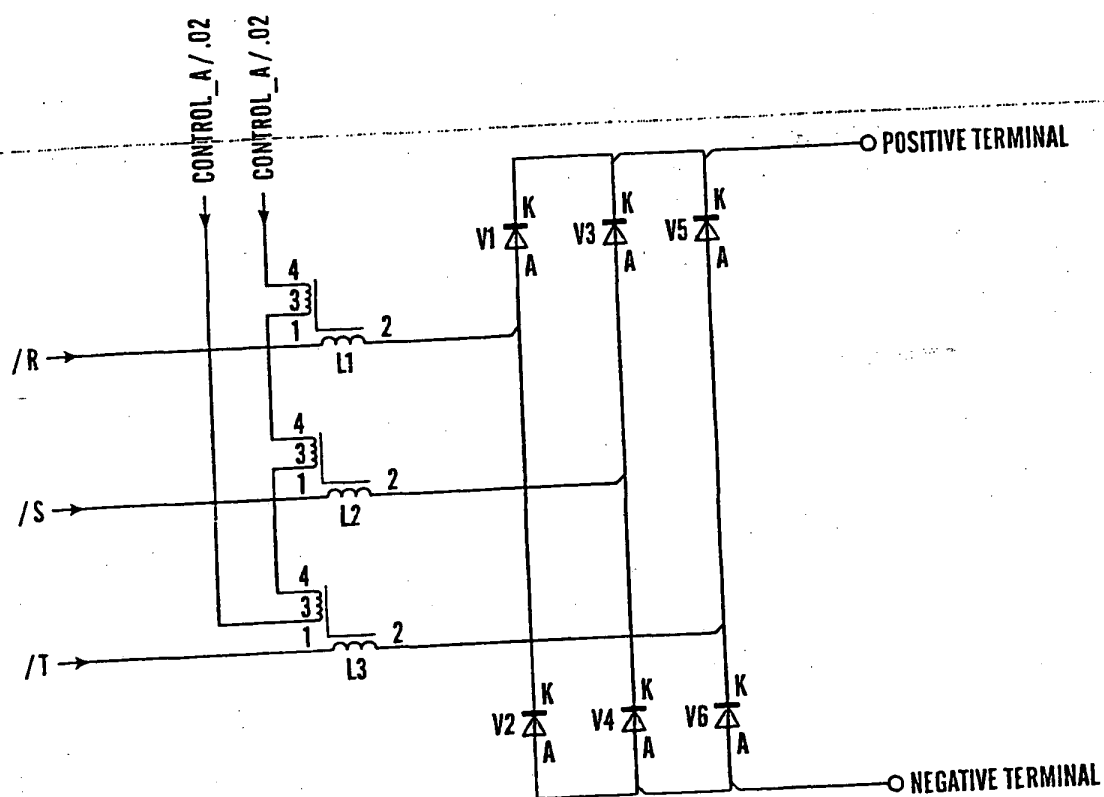


Fig.62

41/54

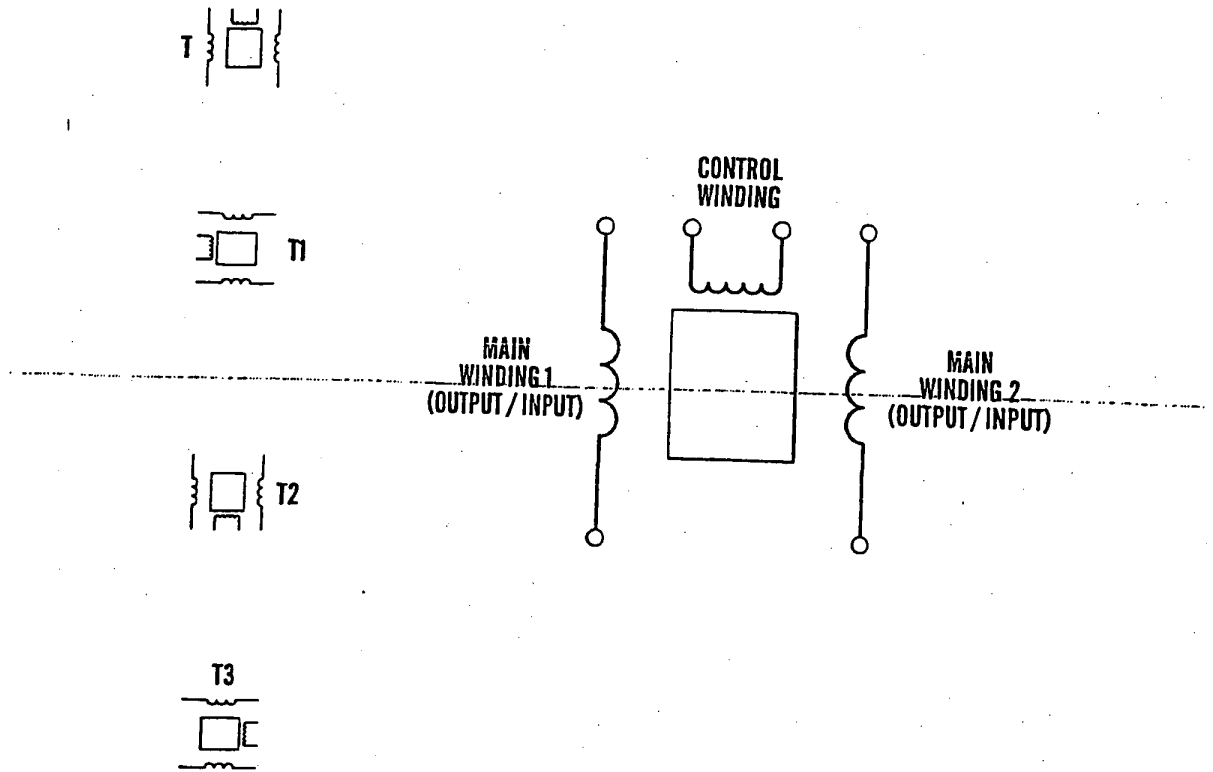


Fig.60

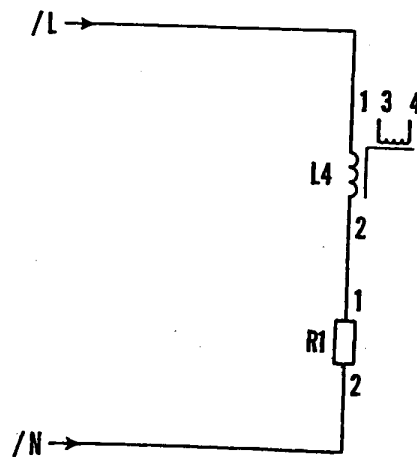


Fig.61

40/54

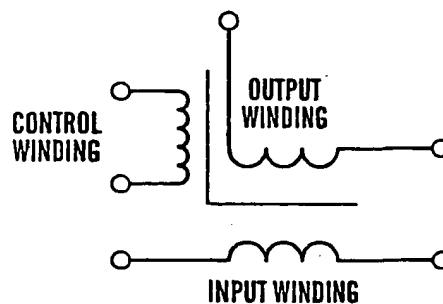


Fig.59

39/54

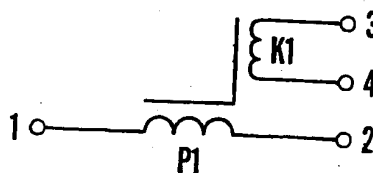


Fig.56

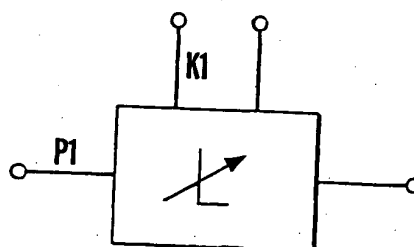


Fig.57

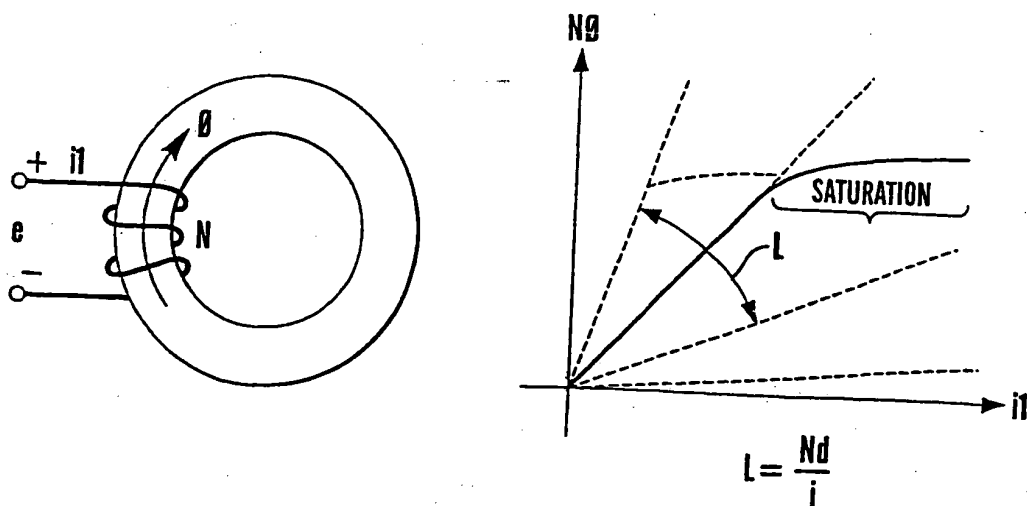


Fig.58

38/54

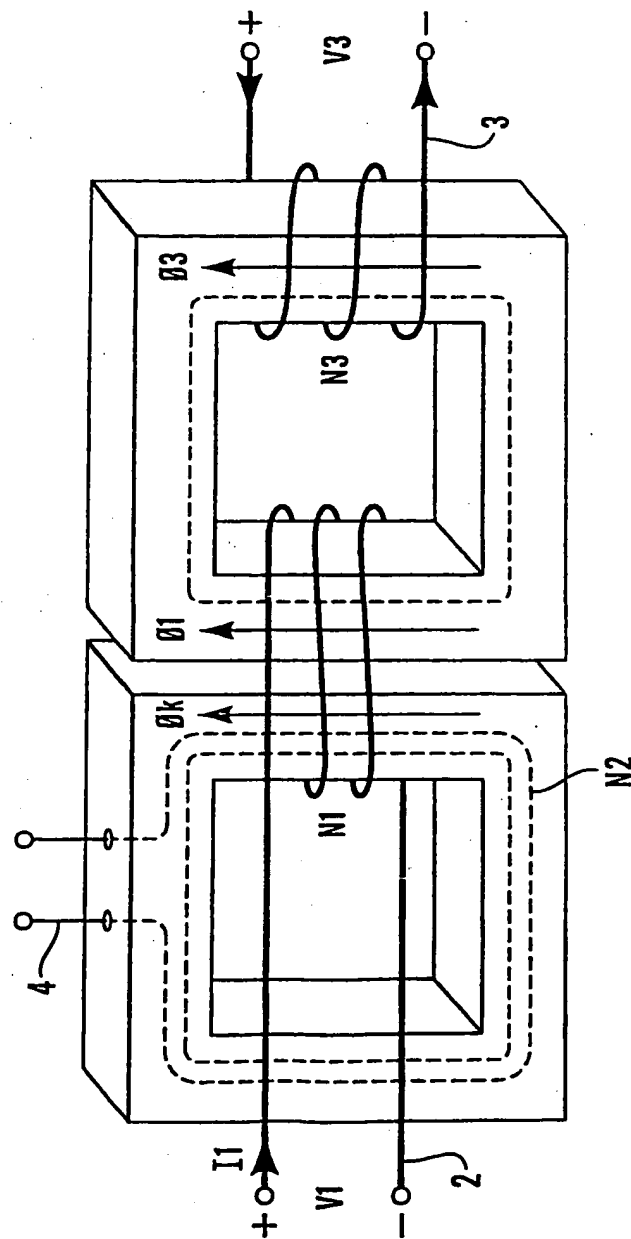


Fig.55

37/54

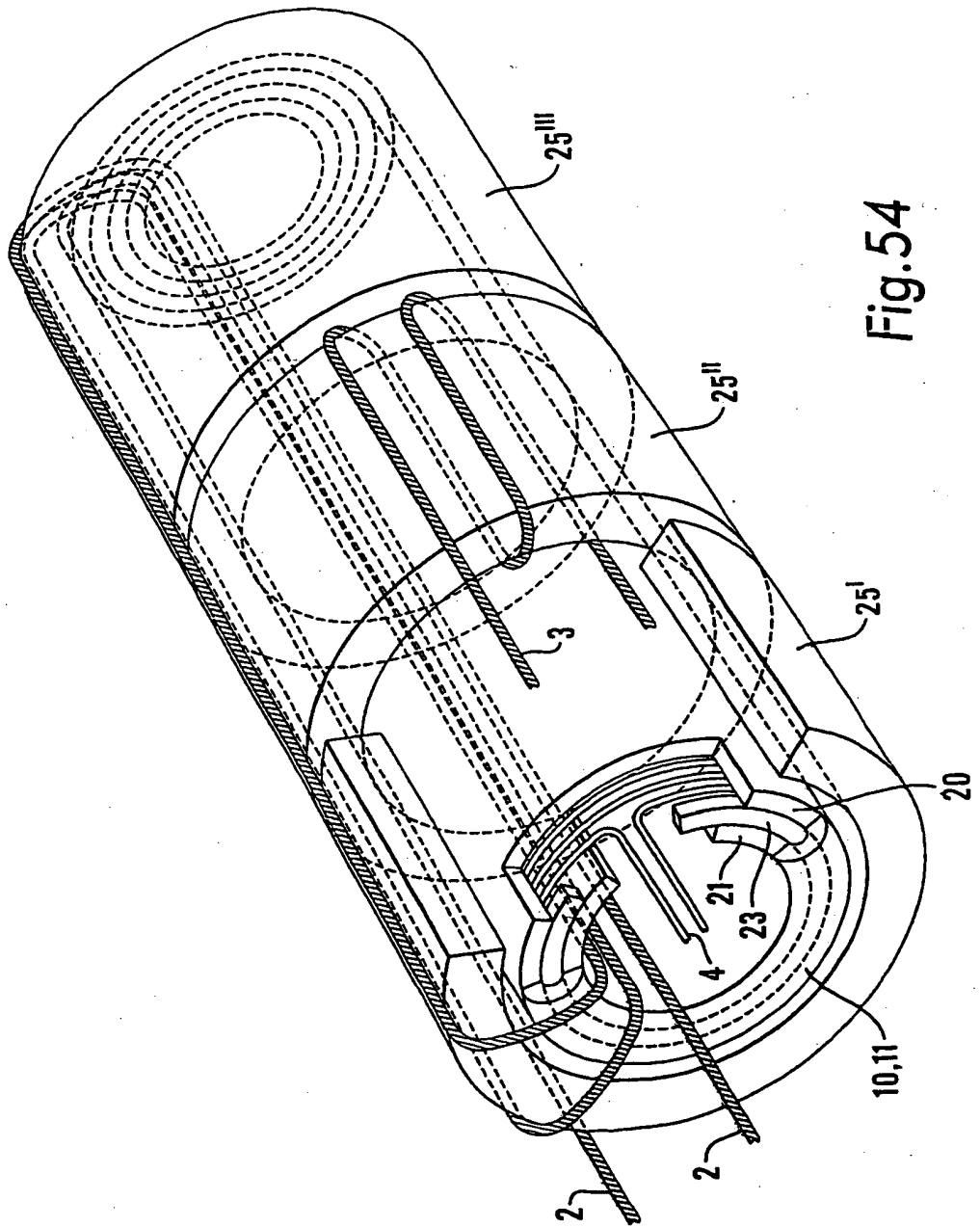


Fig. 54



TABLE 2

Compound No.	Physicochemical Characteristics
A-1	Appearance: Light yellow liquid IR (cm <sup>-1</sup> ) : 3450, 3290, 1690
A-2	Appearance: Colorless crystal m.p. (°C) : 101-103 IR (cm <sup>-1</sup> ) : 3420, 3300, 1680
A-3	Appearance: Light yellow crystal m.p. (°C) : 75-77 IR (cm <sup>-1</sup> ) : 3410, 3310, 1670
A-4	Appearance: Light yellow crystal m.p. (°C) : 96-98 IR (cm <sup>-1</sup> ) : 3450, 3300, 1680
A-5	Appearance: Colorless crystal m.p. (°C) : 146-148 IR (cm <sup>-1</sup> ) : 3450, 3290, 1680
A-6	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3440, 3300, 1675
A-7	Appearance: Colorless crystal m.p. (°C) : 132-134 IR (cm <sup>-1</sup> ) : 3450, 3370, 1665
A-8	Appearance: Yellow crystal m.p. (°C) : 72-74 IR (cm <sup>-1</sup> ) : 3440, 3320, 1680
A-9	Appearance: Colorless crystal m.p. (°C) : 87-89 IR (cm <sup>-1</sup> ) : 3400, 3290, 1670
A-10	Appearance: Light brown crystal m.p. (°C) : 80-82 IR (cm <sup>-1</sup> ) : 3450, 3280, 1680
A-11	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3170, 1680

TABLE 2 (Continued)

Compound No.	Physicochemical Characteristics
A-12	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 103-105 IR ( $\text{cm}^{-1}$ ) : 3440, 3160, 1680
A-13	Appearance: Light brown liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3160, 1680
A-14	Appearance: Light brown crystal m.p. ( $^{\circ}\text{C}$ ) : 68-70 IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1690
A-15	Appearance: Light brown crystal m.p. ( $^{\circ}\text{C}$ ) : 140-141 IR ( $\text{cm}^{-1}$ ) : 3450, 3130, 1690
A-16	Appearance: Light brown liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3260, 1680
A-17	Appearance: Light yellow liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3290, 1690
A-18	Appearance: Light red brown crystal m.p. ( $^{\circ}\text{C}$ ) : 108-110 IR ( $\text{cm}^{-1}$ ) : 3440, 3375, 1670
A-19	Appearance: Light brown liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3290, 1675
A-20	Appearance: Light brown liquid IR ( $\text{cm}^{-1}$ ) : 3440, 3360, 1670
A-21	Appearance: Light brown liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3310, 1690
A-22	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 50-52 IR ( $\text{cm}^{-1}$ ) : 3450, 3290, 1690

TABLE 2 (Continued)

Compound No.	Physicochemical Characteristics
A-23	Appearance: Light yellow liquid IR (cm <sup>-1</sup> ) : 3450, 3300, 1690
A-24	Appearance: Light yellow crystal m.p. (°C) : 108-110 IR (cm <sup>-1</sup> ) : 3470, 3300, 1670
A-25	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3160, 1680
A-26	Appearance: Colorless crystal m.p. (°C) : 130-132 IR (cm <sup>-1</sup> ) : 3450, 3175, 1685
A-27	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3160, 1680
A-28	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3170, 1685
A-29	Appearance: Light brown crystal m.p. (°C) : 66-68 IR (cm <sup>-1</sup> ) : 3430, 3300, 1670
A-30	Appearance: Light brown crystal m.p. (°C) : 180-182 IR (cm <sup>-1</sup> ) : 3420, 3300, 1690, 1665
A-31	Appearance: Colorless crystal m.p. (°C) : 129-131 IR (cm <sup>-1</sup> ) : 3460, 3230, 1700, 1670
A-32	Appearance: Light brown crystal m.p. (°C) : 129-131 IR (cm <sup>-1</sup> ) : 3450, 3300, 1675
A-33	Appearance: Light brown crystal m.p. (°C) : 168-170 IR (cm <sup>-1</sup> ) : 3480, 3300, 1710, 1670

TABLE 2 (Continued)

Compound No.	Physicochemical Characteristics
A-34	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 130-132 IR ( $\text{cm}^{-1}$ ) : 3450, 3130, 1690
A-35	Appearance: Light brown crystal m.p. ( $^{\circ}\text{C}$ ) : 155-157 IR ( $\text{cm}^{-1}$ ) : 3450, 3125, 1690
A-36	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 92-94 IR ( $\text{cm}^{-1}$ ) : 3470, 3240, 1715, 1675
A-37	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 86-88 IR ( $\text{cm}^{-1}$ ) : 3450, 3290, 1675
A-38	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 96-98 IR ( $\text{cm}^{-1}$ ) : 3470, 3270, 1710, 1670
A-39	Appearance: Light brown crystal m.p. ( $^{\circ}\text{C}$ ) : 117-119 IR ( $\text{cm}^{-1}$ ) : 3380, 3230, 1680
A-40	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 174-176 IR ( $\text{cm}^{-1}$ ) : 3450, 3240, 1710, 1675
A-41	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 74-76 IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1675
A-42	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 147-149 IR ( $\text{cm}^{-1}$ ) : 3475, 3310, 1715, 1670
A-43	Appearance: Light yellow liquid IR ( $\text{cm}^{-1}$ ) : 3460, 3300, 1675
A-44	Appearance: Light yellow crystal m.p. ( $^{\circ}\text{C}$ ) : 81-83 IR ( $\text{cm}^{-1}$ ) : 3400, 3300, 1675

TABLE 2 (Continued)

Compound No.	Physicochemical Characteristics
A-45	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3460, 3275, 1680
A-46	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3460, 3300, 1680
A-47	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3400, 3300, 1680
A-48	Appearance: Colorless liquid IR (cm <sup>-1</sup> ) : 3450, 3300, 1730, 1670
A-49	Appearance: Light brown crystal m.p. (°C) : 132-134 IR (cm <sup>-1</sup> ) : 3450, 3290, 1700, 1675
A-50	Appearance: Light brown crystal m.p. (°C) : 73-75 IR (cm <sup>-1</sup> ) : 3400, 3310, 1680, 1665
A-51	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3170, 1680
A-52	Appearance: Brown liquid IR (cm <sup>-1</sup> ) : 3450, 3270, 1690
A-53	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3200, 1680
A-54	Appearance: Colorless crystal m.p. (°C) : 97-98 IR (cm <sup>-1</sup> ) : 3360, 3250, 1670
A-55	Appearance: Light brown crystal m.p. (°C) : 120-122 IR (cm <sup>-1</sup> ) : 3450, 3300, 1675

TABLE 2 (Continued)

Compound No.	Physicochemical Characteristics
A-56	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3300, 1690
A-57	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3280, 1680
A-58	Appearance: Colorless crystal m.p. (°C) : 79-81 IR (cm <sup>-1</sup> ) : 3450, 3300, 1700
A-59	Appearance: Brown liquid IR (cm <sup>-1</sup> ) : 3450, 3170, 1685
A-60	Appearance: Colorless crystal m.p. (°C) : 139-141 IR (cm <sup>-1</sup> ) : 3470, 3210, 1705, 1670
A-61	Appearance: Colorless crystal m.p. (°C) : 106-108 IR (cm <sup>-1</sup> ) : 3475, 3230, 1710, 1665
A-62	Appearance: Light brown liquid IR (cm <sup>-1</sup> ) : 3450, 3170, 1670
A-63	Appearance: Brown liquid IR (cm <sup>-1</sup> ) : 3450, 3170, 1685
A-64	Appearance: Light yellow crystal m.p. (°C) : 53-55 IR (cm <sup>-1</sup> ) : 3440, 3225, 1670
A-65	Appearance: Light brown crystal m.p. (°C) : 87-89 IR (cm <sup>-1</sup> ) : 3430, 3290, 1680
A-66	Appearance: Light yellow liquid IR (cm <sup>-1</sup> ) : 3440, 3300, 1680

TABLE 2 (Continued)

Compound No.	Physicochemical Characteristics
A-67	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 134-135 IR ( $\text{cm}^{-1}$ ) : 3400, 3230, 1670
A-68	Appearance: Light yellow liquid : IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1675
A-69	Appearance: Light brown crystal m.p. ( $^{\circ}\text{C}$ ) : 66-68 IR ( $\text{cm}^{-1}$ ) : 3445, 3160, 1690
A-70	Appearance: Light yellow crystal m.p. ( $^{\circ}\text{C}$ ) : 106-108 IR ( $\text{cm}^{-1}$ ) : 3450, 3295, 1680
A-71	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 113-115 IR ( $\text{cm}^{-1}$ ) : 3350, 3170, 1695, 1665
A-72	Appearance: Light brown liquid m.p. ( $^{\circ}\text{C}$ ) : 94-96 IR ( $\text{cm}^{-1}$ ) : 3375, 3300, 1680
A-73	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 117-119 IR ( $\text{cm}^{-1}$ ) : 3440, 3180, 1680
A-74	Appearance: Yellow liquid : IR ( $\text{cm}^{-1}$ ) : 3450, 3290, 1685
A-75	Appearance: Light brown liquid : IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1670
A-76	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 102-104 IR ( $\text{cm}^{-1}$ ) : 3400, 3290, 1670
A-77	Appearance: Brown liquid : IR ( $\text{cm}^{-1}$ ) : 3440, 3310, 1670

TABLE 2 (Continued)

Compound No.	Physicochemical Characteristics
A-78	Appearance: Light brown crystal m.p. ( $^{\circ}\text{C}$ ) : 79-81 IR ( $\text{cm}^{-1}$ ) : 3450, 3295, 1675
A-79	Appearance: Light yellow crystal m.p. ( $^{\circ}\text{C}$ ) : 128-130 IR ( $\text{cm}^{-1}$ ) : 3475, 3325, 1670
A-80	Appearance: Light yellow liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3250, 1680
A-81	Appearance: Light yellow liquid IR ( $\text{cm}^{-1}$ ) : 3460, 3270, 1680
A-82	Appearance: Light brown liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3270, 1685
A-83	Appearance: Gray crystal m.p. ( $^{\circ}\text{C}$ ) : 178-180 IR ( $\text{cm}^{-1}$ ) : 3430, 3140, 1650
A-84	Appearance: Light brown crystal m.p. ( $^{\circ}\text{C}$ ) : 114-116 IR ( $\text{cm}^{-1}$ ) : 3470, 3300, 1670
A-85	Appearance: Light brown liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3270, 1680
A-86	Appearance: Colorless crystal m.p. ( $^{\circ}\text{C}$ ) : 114-116 IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1670
A-87	Appearance: Light brown liquid IR ( $\text{cm}^{-1}$ ) : 3450, 3275, 1690

As ergosterol biosynthesis-inhibitive type fungicidal compounds among Group B compounds, azole type fungicidal compounds, such as Triadimefon (by ISO (International Organization for Standardization) nomenclature, hereinafter the same), Triadimenol, Triflumizole, Propiconazole, Prochloraz, Pefurazoate, Flusilazole, Ipconazole, Metoconazole and the like are given. N-(3,5-dichlorophenyl)carboximide fungicidal compounds, such as Iprodione, Procymidone and Vinclozolin are given as the carboximide fungicidal compounds. Given as preferable examples of benzimidazole fungicidal compounds are Benomyl, Thiophanate, Thiophanate methyl, Carbendazim, Fuberidazol, Cypendazole, Thiabendazole and the like. Preferable examples of carbamate fungicidal compounds include Diethofencarb and the like.

The fungicidal composition for agriculture and horticulture of the present invention can be prepared by simply blending a group A compound and a group B compound. The fungicidal composition of the present in-



vention also can be prepared by blending a formulation containing a group A compound and a formulation containing a group B compound. It is, however, desirable to use a formulation of powder, wettable agent, granule, emulsion concentrate or the like, which contains at least one group A compound and at least one group B compound together with formulation adjuvants. The amount of compounds contained in such a preparation is 0.1 to 95% by weight, preferably 0.5 to 90% by weight, and more preferably 2 to 70% by weight, for both the group A compound and the group B compound.

Formulation adjuvants which can be used include carriers, diluents and surfactants. Given as specific examples are solid carriers such as talc, kaolin, bentonite, diatomaceous earth, white carbon and clay; and liquid diluents such as water, xylene, toluene, chlorobenzene, cyclohexane, cyclohexanone, dimethylsulfoxide, dimethylformamide, and alcohol. Various surfactants may be used depending on the effects intended. Examples include emulsifiers such as polyoxyethylene alkylaryl ether and polyoxyethylene sorbitan monolaurate; dispersants such as lignin sulfonate and dibutyl-naphthalene sulfonate; and wetting agents such as alkyl sulfonate and alkylphenyl sulfonate.

The above-mentioned formulations include those used as are and those used after diluted with water or the like to a prescribed concentration. When used after dilution, the concentration of the effective components of the present invention is preferably in the range of 0.001 to 1.0% by weight.

The effective components of the present invention can be used in combination with other active ingredients such as, for example, bactericides, insecticides, acaricides and herbicides.

According to the present invention, the combined use of at least one derivative of 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide represented by formula (I) and at least one fungicidal compound selected from the group consisting of ergosterol biosynthesis-inhibitive type compounds, carboximide compounds, benzimidazole compounds and carbamate compounds exhibits a superior synergistic effect. This synergistic effect ensures reduction in the amount of the drugs to be used and enables the composition of the present invention useful as a fungicide composition for agriculture and horticulture, particularly for combating the gray mold disease.

Other features of the invention will become apparent in the course of the following description of the exemplary embodiments which are given for illustration of the invention and are not intended to be limiting thereof.

## EXAMPLES

In order to make clear the synergistic effect of a group A compound and a group B compound, an expected degree of attack by disease in test examples below was calculated according to the method proposed by R. S. Colbey (Weed, vol. 15, pp 20-22). Specifically, rating a completely attacked case at 100 and completely controlled case at 0 in evaluating the respective degree of attacks X and Y when a group A compound or a group B compound was used individually, the expected degree of attack (E) for the combined use of the group A compound and the group B compound was calculated according to the following equation (1).

$$E = X \cdot Y / 100 \quad (1)$$

The exhibition of the synergistic effect can be evidenced if the degree of attack obtained by the use of the fungicide composition of the present invention, in which the group A compound and the group B compound are mixed, is smaller than the expected degree of attack (E) calculated by the above equation (1).

Tests for controlling effect against gray mold were carried out according to the cucumber fruit method (Nobuo TEZUKA, Akira KISO, J. Pesticide Sci., 1, 321-324 (1976)).

This test method consists of cutting a washed cucumber fruit into 5 cm pieces, dipping the pieces in a drug solution of a prescribed concentration for 10 minutes, then drying in air, placing them on a plate of PSA medium filled with *Botrytis cinerea*, and measuring the attacked height increased in five days. The rate of attack in the treated area was then determined from the attacked height in the treated area for the attacked height of the untreated area as 100.

The characteristics of this method reside in that it is close to the actual field test, it can quickly detect the effect of drugs in a simple manner, and it can quantitatively determine the effects of drugs with ease.

# EP 0 603 845 A1

## Formulation Example 1 <Dust>

5

10

	parts by weight
Group A compound	3
Group B compound	3
Clay	40
Talc	54

The above ingredients were pulverized and mixed to obtain a dust.

## Formulation Example 2 <Wettable Powder>

15

20

25

	parts by weight
Group A compound	25
Group B compound	25
Lignin sulfonate	5
Alkyl sulfonate	3
Diatomaceous earth	42

The above ingredients were pulverized and mixed to obtain wettable powder.

## Formulation Example 3 <Granules>

30

35

40

45

50

55

parts by weight

Group A compound	5
Group B compound	5
Bentonite	38
Clay	45
Lignin sulfonate	7

The above ingredients were mixed and kneaded with the addition of water. The mixture was extruded and then dried to obtain granules.

## Formulation Example 4 &lt;Emulsion Concentrate&gt;

	parts by weight
Group A compound	20
Group B compound	20
Polyoxyethylene alkylaryl ether	10
Polyoxyethylenesorbitan monolaurate	3
Xylene	47

The above ingredients were mixed and dissolved to obtain an emulsion concentrate.

## Test Example 1

<Test for controlling effect against cucumber gray mold (*Botrytis cinerea* on cucumber)>

A cucumber was washed, cut into 5 cm pieces, dipped in a drug solution made by diluting the emulsion prepared in Formulation Example 4 to a prescribed concentration for 10 minutes, and dried in air. The cucumber pieces were then placed on a plate of PSA medium filled with *Botrytis cinerea*. After five days, the increase in the height of the attacked site was measured. The rate of attack in the treated area was determined taking the height of attack in the untreated area as 100. The results are shown in Table 3.

In order to make the effect of the present invention clear, the values of expected degree of attack (E) calculated by the Colbey's equation (1) are also given in Table 3.

TABLE 3

Compound No. or Compound name	Concentration (ppm)	Attacked ratio (%)	Expected ratio E (%)	Attacked
Untreated	-	100	-	
Compound (A-54)	25	58		
Compound (A-67)	25	74		
Compound (A-53)	25	74		
Ipconazole	25	36		
Meticonazole	25	26		
Flusilazole	25	64		
Iprodione	25	45		
Procymidone	25	90		
Compound (A-54) + Ipconazole	25+25	8	21	
Compound (A-54) + Meticonazole	25+25	8	15	
Compound (A-54) + Flusilazole	25+25	20	37	

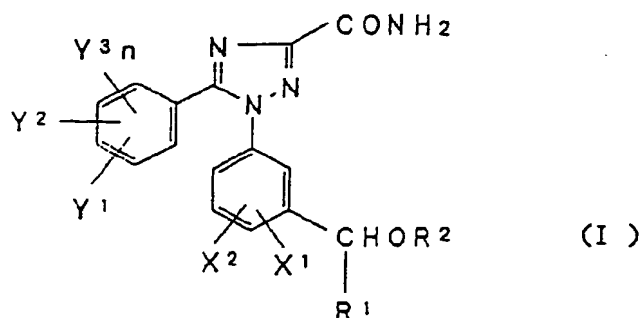
TABLE 3 (Continued)

Compound No. or Compound name	Concentration (ppm)	Attacked ratio (%)	Expected Attacked ratio E (%)
Compound (A-54) + Iprodione	25+25	0	26
Compound (A-54) + Procymidone	25+25	2	52
Compound (A-67) + Ipconazole	25+25	14	27
Compound (A-67) + Metoconazole	25+25	7	19
Compound (A-67) + Flusilazole	25+25	35	48
Compound (A-67) + Iprodione	25+25	3	34
Compound (A-67) + Procymidone	25+25	5	67
Compound (A-53) + Ipconazole	25+25	7	27
Compound (A-53) + Metoconazole	25+25	6	19
Compound (A-53) + Flusilazole	25+25	27	48
Compound (A-53) + Iprodione	25+25	3	34
Compound (A-53) + Procymidone	25+25	6	67

Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

#### Claims

1. A fungicidal composition for agriculture and horticulture use, which comprises as effective components, at least one derivative of 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide represented by the following formula (I),



wherein R<sup>1</sup> is a C<sub>1</sub>-C<sub>6</sub> alkyl group, a C<sub>3</sub>-C<sub>6</sub> cycloalkyl group, a C<sub>1</sub>-C<sub>5</sub> fluoroalkyl group, a (C<sub>1</sub>-C<sub>4</sub> alkoxy)methyl group or a phenyl group, R<sup>2</sup> is a C<sub>1</sub>-C<sub>6</sub> alkyl group, a (C<sub>3</sub>-C<sub>6</sub> cycloalkyl)methyl group, a C<sub>2</sub>-C<sub>5</sub> fluoroalkyl group, a (C<sub>1</sub>-C<sub>4</sub> alkoxy)(C<sub>1</sub>-C<sub>4</sub> alkyl) group, a phenyl group, a phenylmethyl group or a phenylmethyl group substituted by a C<sub>1</sub>-C<sub>4</sub> alkyl group or a halogen atom, X<sup>1</sup> represents a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group, a C<sub>1</sub>-C<sub>4</sub> alkoxy group or a halogen atom, X<sup>2</sup> represents a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group or a halogen atom, Y<sup>1</sup> is a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group, a C<sub>1</sub>-C<sub>4</sub> alkoxy group, a C<sub>1</sub>-C<sub>4</sub> fluoroalkoxy group, a HO group, a HOOC group or a (C<sub>1</sub>-C<sub>4</sub> alkoxy)carbonyl group, Y<sup>2</sup> is a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group or a halogen atom, Y<sup>3</sup> is a hydrogen atom or a halogen atom, and n denotes 1 or 2, and

at least one fungicidal compound selected from the group consisting of ergosterol biosynthesis-inhibitive type compounds, carboximide compounds, benzimidazole compounds and carbamate compounds.

2. The fungicidal composition according to Claim 1, wherein said 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide is 1-[3-(1-n-butoxy-2-methylpropyl)phenyl]-5-(substituted or unsubstituted)phenyl-1,2,4-triazole-3-carboxamide.
3. The fungicidal composition according to Claim 1, wherein the ergosterol biosynthesis-inhibitive type fungicidal compound is a compound selected from the group consisting of Triadimefon, Triadimenol, Triflumizole, Propiconazole, Prochloraz, Pefurazoate, Flusilazole, Iaconazole and Metoconazole.
4. The fungicidal composition according to Claim 1, wherein the carboximide fungicidal compound is a N-(3,5-dichlorophenyl)carboximide fungicidal compound.
5. The fungicidal composition according to Claim 4, wherein the N-(3,5-dichlorophenyl)carboximide fungicidal compound is a compound selected from the group consisting of Iprodione, Procymidone and Vinclozolin.
6. The fungicidal composition according to Claim 1, wherein the benzimidazole fungicidal compound is a compound selected from the group consisting of Benomyl, Thiophanate, Thiophanate methyl, Carbendazim, Fuberidazol, Cypendazole and Thiabendazole.
7. The fungicidal composition according to Claim 1, wherein the carbamate fungicidal compound is Diethofencarb.
8. The fungicidal composition according to Claim 1, which an agent combating the gray mold disease.



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 93 12 0661

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	EP-A-0 427 695 (MONSANTO COMPANY) ---		A01N43/653 //(A01N43/653, 43:653,47:38, 55:00,37:32, 47:20,47:34, 47:18,43:52, 43:78,47:20)
A	EP-A-0 182 740 (CIBA-GEIGY AG) ---		
P,A	EP-A-0 522 558 (KUREHA CHEMICAL INDUSTRY CO., LTD.) -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			A01N
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 23 March 1994	Examiner Donovan, T
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  -----  A : member of the same patent family, corresponding document</p>			

EPO FORM 1503 (03.92) (P04C01)

**THIS PAGE BLANK (USPTO)**